PRELIMINARY ASSESSMENT/VISUAL SITE INSPECTION REPORT
FOR
MORTON INTERNATIONAL, INC.
READING, OHIO
EPA ID NO. OHD000724138

Submitted to:

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RELEASED
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BIN # 2013-00085
INITIALS CM
TOM NASH

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I. EXECUTIVE SUMMARY

The RCRA Facility Assessment (RFA) is the first step in implementing the corrective action provisions of the 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA). The purpose of the RFA is to identify environmental releases or potential releases from Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that may require corrective action by the facility owner. A Preliminary Assessment/Visual Site Inspection (PA/VSI) is a form of an RFA suitable for implementing the corrective action provisions of HSWA. This PA/VSI Report constitutes the reporting requirement for the RFA at the Morton International, Inc. (Morton) facility in Reading, Ohio.

A preliminary assessment (PA) of the available U.S. Environmental Protection Agency (U.S. EPA) and State of Ohio file materials was conducted to familiarize the TechLaw, Inc. (TechLaw) Team members with past compliance history, evidence of past releases, potential migration pathways, potential for exposure to any released hazardous constituents, closure methods and dates, citizen complaints, manufacturing processes and waste management practices at the Morton facility.

A Visual Site Inspection (VSI) was conducted on May 12, 1998, by a TechLaw Team to identify and characterize SWMUs and AOCs. The following Morton employees participated in the facility tour:

- Bruce Beiser, Plant Manager
- Brian L. Leatherman, Manager, Environmental Affairs
- Glenn E. Schaaf, Manager, Health, Safety & Environmental
- Matthew A. DeMaison, Environmental Engineer

Photographs were taken during the VSI and are documented in Appendix A. The VSI Field Notebooks are included in Appendix B, and a Site Map showing SWMU and AOC locations are presented in Appendix C. A list of historical hazardous waste streams is included in Appendix D.

A total of eleven SWMUs were identified. These are described in more detail in Section III of this Report. Releases to soil and groundwater are documented at the Former Surface Impoundments (SWMU 1) and the Former Swale Area (SWMU 10), resulting in the designation of a high release potential for these units. The Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) were installed to collect and treat contaminated groundwater and prevent off-site migration of contaminants through the shallow aquifer. Thus, although the release potential is high for SWMUs 1 and 10, the facility has apparently implemented measures to prevent the off-site migration of hazardous constituents through shallow groundwater. The effectiveness of the Groundwater Treatment Unit (SWMU 7) in removing contaminants should be analyzed, however, in order to ensure that the treated water does not pose a further threat of contamination. In addition, since it appears that deeper portions

of the aquifer are used for domestic purposes in the vicinity of the Morton facility, potential contaminant migration from the Former Surface Impoundments (SWMU 1) and Former Swale Area (SWMU 10) to the deeper portions of the aquifer should be investigated. Furthermore, it is recommended that sediments in Mill Creek (adjacent to the facility) be investigated to determine the extent of impacts from past contaminated leachate releases associated with the Former Surface Impoundments (SWMU 1).

The Combined Sewer System (SWMU 11) was not directly observed during the VSI, and the construction and exact location were not confirmed by Morton representatives. Additional information regarding the Combined Sewer System (SWMU 11) should be provided by Morton representatives so that the potential for release from the unit can be determined.

II. SITE DESCRIPTION

The Morton facility is located at 2000 West Street in the City of Reading, Ohio. The facility is bordered to the west by Mill Creek, to the east by Conrail railroad tracks, and to the south by a public recreation area (including a city park, a public pool, athletic fields, and a municipal stadium). This recreation area is owned by the Morton facility but is managed by the City of Reading. Bordering the facility to the north are Cincinnati Drum Service, a drum recycling facility, and Pristine, Inc., a former hazardous waste incineration and disposal facility which is now a National Priorities List (NPL) site.

The current owner and operator of the facility is Morton International, Inc. The Morton facility covers approximately 34 acres, with 27 acres of production area and seven acres of public recreation area. Access to the production area is restricted by a fence, and the facility entrance is guarded 24 hours a day. The production area contains 28 buildings, including two office buildings, a laboratory building, and numerous processing and warehouse buildings. Approximately seventy aboveground storage tanks are located in the northern portion of the site. The facility has approximately 200 employees.

Prior to 1949, the western and southern sections of the current Morton facility were part of a large dairy farm. The northern section of the property had formerly been used as a winery and smokehouse, and earlier as a fireworks manufacturing facility. In approximately 1949, the land comprising the current facility was purchased and developed by the Cincinnati Milling Machine Company, conducting business under the name Carlisle Chemical Works. No information on the processing activities or products of the Carlisle Chemical Works was noted in the available file material. The name Carlisle Chemical Works was changed to Cincinnati Milacron (Milacron) in 1970. Milacron constructed the chemical manufacturing facilities at the site and operated the plant until 1980. At that time, the facility was purchased by Carstab Corporation (Carstab), a division of Thiokol, Inc. In 1982, Thiokol, Inc. merged with Morton International, Inc. (Morton). The two companies separated in 1989, with Morton retaining ownership of the Reading, Ohio facility. However, the facility is still referred to as Carstab in many recent documents.

Morton manufactures synthetic heat stabilizers and lubricants for rigid polyvinyl chloride (PVC), asphalt performance chemicals, antioxidants, plastic lubricants, and specialty chemicals for the plastics and petroleum industries. Up to 80 different products are manufactured at the facility. Waste materials from approximately half of the product lines are discharged from the site through the sanitary sewer system, while the remaining materials are temporarily stored on-site before being disposed of off-site. As of August 1991, the company produced approximately 150,000 to 170,000 pounds of hazardous wastes per year. According to OEPA, the facility's primary waste product as of 1997 was methanol, produced at a rate of approximately four drums per week.

The VSI did not include a tour of the processing buildings, and no detailed descriptions of Morton's process activities were found in the available file material or provided by Morton

representatives. Detailed waste stream documentation is also not readily available for the Morton facility, due to the fact that waste stream records were not maintained until after the inception of RCRA in the early 1980s. By that time, the facility had reportedly discontinued all on-site disposal.

Hazardous wastes from various process areas are collected in five Satellite Waste Accumulation Areas (SWMU 8) at the facility. Collected drums of hazardous waste were stored for less than 90-days in the Former Drum Storage Area (SWMU 3) between 1980 and 1992. A listing of the Hazardous wastes reportedly generated at the facility between 1981 and 1990 is provided in Appendix D. Since 1992, drums of hazardous waste have been stored for less than 90-days in the Hazardous Waste Drum Storage Area (SWMU 4). Currently, approximately 30 to 40 drums of D001 hazardous waste and smaller volumes of D002, D004, D007, D008, F003 and F005 hazardous wastes are reportedly generated each month.

From 1950 to 1980, selected facility wastes, including low pH wastewaters, were neutralized and disposed of in the Former Surface Impoundments (SWMU 1). The wastes consisted primarily of dilute hydrochloric acid, methanol, dilute sulfuric acid, resorcinol, and benzoic acid.

Low levels of heavy metals, waste oils, and benzene compounds were reportedly also components of the disposed wastes. According to Morton representatives, the waste streams feeding the Former Surface Impoundments were eliminated in the early to mid-1980s. From the 1980s to approximately 1993, low pH process wastewaters were neutralized in the Former Neutralization Tank (SWMU 2). In 1993, Morton began operation of a pH Control System (SWMU 9), which is used to neutralize process wastewater, sanitary water and storm runoff collected in the Combined Sewer System (SWMU 11) prior to discharge to the Municipal Sewer District (MSD) of Greater Cincinnati.

High pH wastewaters generated by the sulfurizing of fats and oils were contained in the Former Sulfide Waste Treatment Tank (SWMU 5) between 1980 and 1986 or 1987. The wastewaters were subsequently shipped off site. No information on Morton's management practices for high pH wastewaters before 1980 or after 1987 was found in the available file material or provided by the facility representatives.

In approximately 1980, it was discovered that contaminants originating from the Former Surface Impoundments (SWMU 1) were migrating to the groundwater, which was subsequently leached into Mill Creek. Contamination also migrated from the Former Swale Area (SWMU 10), which reportedly is the site of buried drums and various other debris. In order to prevent the flow of contaminated groundwater from the Morton facility into Mill Creek, a groundwater collection and treatment system was installed. Groundwater is collected by a Groundwater Collection System (SWMU 6) and pumped to the Groundwater Treatment Unit (SWMU 7). At the Groundwater Treatment Unit (SWMU 7), the flow and pH of the water is measured, and hydrogen peroxide is added to oxidize the sulfur-containing materials. This process liberates elemental sulfur, and eliminates the possibility of sulfide release if the water becomes acidic.

The treated water, approximately 10,000 to 12,000 gallons per day, is then discharged to the MSD. In 1992, Morton added additional treatment steps to the process in order to use a large portion of the treated groundwater as make-up water in the facility's recirculating non-contact cooling water system. The additional treatment involves solids filtration and passage through several activated carbon adsorption drums.

In 1993, piles of potentially contaminated soils were discovered during a site investigation. File materials indicated that the soils were potentially located on Morton's property. Morton correspondence from November 23, 1992 indicated that the top eight feet of material in the soil piles showed "no unusual characteristics" in terms of contamination, although deeper soil samples revealed low levels of ethylbenzene (12 ppb), totuene (22 ppb), acetone (22 ppb) and total xylenes (140 ppb). Following the VSI, Morton indicated that the property containing the soil piles is owned by the City of Reading, which graded the area in the mid-1990s to allow for landscaping. Since the property is not owned by Morton, this area was not identified as a SWMU or AOC.

Two underground storage tanks (USTs) were formerly located in the east central portion of the Morton facility. The first UST had a volume of 12,000 gallons and was used for storing fuel oil. The second UST had a volume of 300 gallons and stored gasoline used by the forklifts at the facility. Both USTs were made of steel and were installed on an unknown date. According to facility representatives, the USTs were removed or closed in 1990 under the guidance of the State Fire Marshall's Office.

Regulatory History

On November 17, 1980, Carstab filed a RCRA Part A application indicating plans to conduct hazardous waste treatment and storage at the facility. Carstab's Part A application was approved in December 1981 and the company operated under interim status pending the filing of a Part B application. Also in December 1981, based on Morton's Part A application, the Hazardous Waste Facility Approval Board of Ohio issued Morton a Hazardous Waste Facility Installation and Operation Permit. In 1983, Morton withdrew the Part A permit application after deciding to abandon waste treatment and storage processes at the facility. Morton was then reportedly considered a hazardous waste generator only. The facility currently stores hazardous wastes for less than 90 days in the Hazardous Waste Drum Storage Area (SWMU 4).

On June 1, 1981, Carstab submitted a Notification of Hazardous Waste Site form to U.S. EPA, pursuant to Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.

On December 1, 1982, Carstab was issued Director's Final Findings and Orders (F&O) for failing to provide Ohio Environmental Protection Agency (OEPA) with sufficient data and results from a hydrogeologic study ordered by OEPA. The initial F&O was later revoked by a second F&O issued on January 12, 1983. See the Release History section for more details regarding the F & Os.

On March 15, 1983, violations by Morton were referred to the Ohio Division of Hazardous Materials Management. The facility was cited for illegal discharge to state waters and illegal discharge of hazardous waste for being the source of contaminated leachate draining into Mill Creek. The referral recommended that the matter be referred to the Attorney General of Ohio or to the federal Superfund program in order to force remedial actions at the site.

On January 30, 1984, the MSD issued a permit allowing Morton to discharge treated groundwater from the Groundwater Treatment Unit (SWMU 7) into the sewer system. Morton's permit application estimated a discharge of approximately 10,000 gallons of water per day, scheduled to begin in July 1984. The permit required monthly reports on groundwater flow and characteristics. Due to delays in the construction of the groundwater treatment system, the permitted discharge did not begin before the permit's expiration date (December 31, 1984). The permit was subsequently extended until December 31, 1985.

OEPA granted Morton a permit to install the Groundwater Collection System (SWMU 6) and Groundwater Treatment System (SWMU 7) on January 29, 1986. This permit was issued after the systems had already been installed.

A June 26, 1986, CERCLA Preliminary Assessment of the Morton facility by OEPA concluded that the groundwater recovery system was functioning satisfactorily, and that the site should be given low Field Investigation Team (FIT) priority and medium State priority as long as the remediation continued.

Permit MIL-026 for discharge to the sanitary sewer was granted to Morton by MSD on November 5, 1990. On April 19, 1991, MSD granted Morton a permit extension lasting until May 1, 1992. According to facility representatives, the same permit has been periodically renewed and is still valid as of June 1998.

OEPA performed a compliance inspection of the Morton facility on April 16, 18, and 29, 1991. Morton was cited for the following violations: failure to maintain adequate inspection logs for drum pads and emergency equipment, and accumulation of more than one 55-gallon drum of waste in a satellite waste accumulation area. The latter violation was later rescinded since generators are allowed three days to remove any waste above 55 gallons in a satellite waste accumulation area.

OEPA Air discharge permits held by the Morton facility, as of August 1991, are listed in Table II-1. Information on Morton's current air permits was requested, but not provided by the facility.

On October 3, 1991, OEPA conducted a Return to Compliance Inspection at Morton. Morton was found to be in compliance regarding the inspection of the drum pads. However, Morton was still out of compliance with regard to the maintenance of a weekly inspection log for emergency equipment.

TABLE II-1
AIR DISCHARGE PERMITS HELD BY MORTON AS OF 1991

Permit Number	Building	Source/Process Description	Expiration Date
B001	--	Boilers	Registration
P004	27	Dev. Activities	Registration
P006	1	Wax Processing	Registration
P009	3, 3A	Tin Mercaptides	3/21/94
P010	3, 3A	Organo Sulfur	3/21/94
P011	3	Thioester	3/21/94
P012	3A	Lubricating Stabilizer	Registration
P016	6	Phosphonium Compounds	3/21/94
P017	12	Organotin Intermediates	6/8/92
P018	16	Spray Tower	12/26/93
P019	11	Organotin Intermediates	6/8/92
P020	27	Oxidation	Registration
P021	28	Spray Tower	6/24/91
P022	Tower 9	Asphalt Additive Production	Registration
P023	Tower 9108	Asphalt	Registration

On December 30, 1991, OEPA notified Morton that the facility was in compliance concerning emergency equipment inspections.

In November 1992, Morton applied to OEPA for a Permit to Install (PTI) for the pH Control System (SWMU 9). A reference was not available to confirm that a permit was issued, but the

facility reportedly installed the system and began operating the pH Control System (SWMU 9) in March 1993.

Environmental Setting

The Morton facility is located in Reading, Hamilton County, Ohio. Reading is a northern suburb of Cincinnati, Ohio. The facility is situated in a mixed use industrial, commercial, and residential area. Approximately 12,000 residents live within a 1-mile radius of the Morton facility. The closest residences are located about 750 feet south of the site.

The Morton facility is located in the central lowland physiographic province. Topographic elevations range from 550 feet above mean sea level in the western area of the site to 578 feet above mean sea level in the northeast corner, where there is a steep topographic rise. The site is underlain by over 100 feet of unconsolidated glacial outwash deposits of gravel, sand, and silt of Pleistocene and Recent age. There are also appreciable amounts of clay in the area. The glacial deposits rest on shale and limestone bedrock of Ordovician age.

Mill Creek, which borders the facility on its west side, is the only surface water body in the immediate vicinity of the Morton site. Mill Creek is used for recreational purposes, but it is not used as a source of drinking water, and no surface water intakes are located within a 3-mile radius of the site.

Available reference documents conflict with regard to the aquifer characteristics in the Morton area. According to a 1982 document prepared by Ecology & Environment, Inc. (E&E) for U.S. EPA, there are two distinct aquifers, one shallow and one deep. The two aquifers are said to be separated by a clay layer 30 to 50 feet thick and an unsaturated sand and gravel zone approximately 45 to 55 feet thick. The clay layer reportedly prevents direct vertical percolation between the shallow and deep aquifer. However, a 1991 report prepared by E&E for U.S. EPA refers to a 1959 Ohio Department of Natural Resources report, which states that the upper glacial deposits and the lower permeable bedrock are hydraulically connected, essentially forming a single aquifer. The groundwater levels in the area lie between 12 and 25 feet below ground surface, with a highly irregular horizon. Groundwater flow in the region is generally from north to south, but is reportedly east to west in the immediate vicinity of the Morton facility.

According to the Ohio-Kentucky-Indiana Regional Council of Governments, there are no private residential wells within a three-mile radius of the site. However, three municipalities (Glendale, Lockland, and Wyoming) draw water from well fields within three miles of the site, supplying water to over 19,000 persons. Two former City of Reading well fields are located less than one mile from the Morton facility. One well field is approximately 500 feet north of Morton, in an area immediately north of the Cincinnati Drum facility, while the other is located about 1,600 feet south of the Morton facility. The city's wells were screened near the surface of the bedrock, over 150 feet below ground surface. In 1988 and 1989, five of Reading's wells were closed after volatile organic compounds (VOCs), primarily 1,2-dichloroethane, were detected at levels

1,2-dichlorobenzene. The source of the substance was unknown, considering that Morton had installed a system to prevent contaminated groundwater from draining into Mill Creek. Groundwater samples collected by the FIT from five on-site monitoring wells also revealed contamination by materials such as chlorobenzene (14 to 56 µg/l), 1,2-dichlorobenzene (12 µg/l), arsenic (32.7 µg/l), manganese (739 µg/l), and vanadium (660 µg/l). The contaminant source could not be identified due to the lack of adequate upgradient monitoring wells. Soil and sediment samples revealed contamination above background levels, with the highest detections coming from the Former Surface Impoundments (SWMU 1) area. The soil sample in the Former Surface Impoundments (SWMU 1) area was collected at a depth of 7 feet and contained elevated levels of chlorobenzene (12,000 µg/kg), toluene (5,000 µg/kg), ethylbenzene (1,600 µg/kg), and total xylenes (10,000 µg/kg) (Note: these values were described in the report as "estimated"). The semivolatile organic compound (SVOC) 1,2-dichlorobenzene was detected at 3,300,000 µg/kg, along with other SVOCs and tentatively identified organic compounds (TICs). The FIT recommended more extensive soil, sediment, surface water, and groundwater sampling at the site in order to determine the extent and source of the contamination.

Correspondence from a Morton contractor dated March 20, 1992 stated that recent samples of groundwater collected at the Morton site contained concentrations of several priority pollutants, most notably dichlorobenzene. Some contaminants, including benzene, chlorobenzene, and 1,4-dichlorobenzene, had been detected at concentrations near the MCL.

In 1992, Morton added a solids (bag) filter and carbon adsorption drums to the Groundwater Treatment Unit (SWMU 7) and began using most of the treated groundwater as make-up water for the facility's non-contact cooling water system.

Between 1992 and 1993, an Expanded Site Inspection (ESI) was performed at the Morton facility by an OEPA contractor. The purposes of the ESI were to collect information for an HRS scoring package and to document any releases, levels of contamination, and attribution of hazardous substances. Analytical results again indicated contamination originating from the Former Surface Impoundments (SWMU 1). Groundwater samples from two monitoring wells located hydraulically downgradient from the Former Surface Impoundments (SWMU 1) area were analyzed. The samples from one downgradient well (MW-EPA-1) contained the following contaminants at concentrations significantly above background levels: acetone (2,700 µg/l), chlorobenzene (2,300 µg/l), benzene (48 µg/l), ethylbenzene (110 µg/l), toluene (630 µg/l), total xylenes (360 µg/l), 1,2-dichlorobenzene (4,700 µg/l), 1,3-dichlorobenzene (110 µg/l), 1,4- dichlorobenzene (640 µg/l), vanadium (14.6 µg/l), and nickel (57.7 µg/l). Groundwater samples taken from wells upgradient and/or lateral to the Former Surface Impoundments (SWMU 1) area and from wells between the former impoundments and potential off-site sources did not contain significant concentrations of the above-mentioned contaminants.

Also during the 1993 ESI, acetone (22 µg/l), chlorobenzene (150 µg/l), 1,2-dichlorobenzene (11 µg/l), nickel (44 µg/l), and vanadium (71.8 µg/l) were detected at concentrations significantly above background levels in the samples from the monitoring well in the Former Swale Area

(SWMU 10). These results, in light of the absence of significant concentrations of contamination found in wells located upgradient of the monitoring well in the Former Swale Area (SWMU 10), give a strong indication that contamination in that monitoring well is originating from the vicinity of the Former Swale Area (SWMU 10).

exceeding Maximum Contaminant Levels (MCLs). In approximately 1988, the city was given a five-year permit to continue using the wells, but only in conjunction with an air-stripping unit. Reading was directed to find an alternate well field location or convert to an alternate water source. According to OEPA representatives, the City of Reading well fields near the Morton facility have been closed since the early to mid-1990s. The source of the VOC contamination had not been pinpointed as of 1993, due in part to the complex nature of the glacial deposits and the numerous potential sources of contamination in the area.

Release History

An explosion and fire occurred at the Morton facility in 1969, during normal on-site processing practices using sodium. One worker was killed and a process building was destroyed. Information on the environmental impact or releases from the explosion was not found in available file materials. Morton representatives indicated that releases to media other than air did not occur, since the sodium, naptha and other materials involved in the processing operations burned.

In June 1979, OEPA became aware of possible releases at Carstab after OEPA personnel observed discolored groundwater leaching from the east bank of Mill Creek along the boundary of Carstab and Cincinnati Drum. During a July 30, 1980 meeting with facility representatives, OEPA requested that Carstab perform a hydrogeologic study to determine the source of leachate at Mill Creek and to identify a method of controlling or removing the leachate releases.

The Former Swale Area (SWMU 10) was investigated by OEPA in June 1980 after a former employee of Cincinnati Milacron, who was involved in an occupational exposure lawsuit against the company, alleged that wastes in steel and fiber drums had been buried in that area. OEPA conducted a survey with a metal detector in the Former Swale Area (SWMU 10) (which is now covered by a parking lot) and found indications of a large concentration of metal. However, a determination of whether or not the metal was buried drums could not be made, considering that the location reportedly had been used by previous land owners as a dumping area for debris from a demolished farmhouse and barn.

In December 1980, ten groundwater monitoring wells were installed at the Morton facility. In January 1981, four additional monitoring wells were installed.

Although a hydrogeologic study requested by OEPA in July 1980 was performed, Carstab failed to provide OEPA with sufficient data and results, which led to the issuance of an F&O on December 1, 1982, in the Matter of Carstab Corporation. The F&O stated that subsurface wastes at the Carstab facility were the cause of leachate entering Mill Creek. The wastes were migrating via a lens of sand and gravel and appearing as leachate where that lens outcropped on the stream bank. Carstab was ordered to complete additional studies to determine the extent of off-site migration and identify appropriate remedial measures. Carstab appealed the initial F&O. The

initial F&O was later revoked by a second F&O issued on January 12, 1983, based on Carstab's (and now Morton's) willingness to cooperate with OEPA and to supply the investigatory results.

A December 9, 1981 report from a Carstab contractor noted that a composite groundwater seepage sample from the Former Surface Impoundments (SWMU 1) area contained elevated levels of organic substances, phenol, various dichlorobenzenes, and arsenic. Chloride, sulfate, and ammonia nitrogen were also detected in somewhat elevated concentrations. A groundwater sample from a monitoring well near the Former Swale Area (SWMU 10) contained elevated levels of organic pollutants, with a total organic carbon (TOC) level of 1,084 mg/l. This well contained some of the highest levels of organic pollutants found in any of the monitoring wells. However, according to the Carstab contractor's report, contamination from the Former Swale Area (SWMU 10) did not appear to be migrating significantly toward Mill Creek (the direction of groundwater flow) at that time.

On May 21, 1982, OEPA requested that the Former Swale Area (SWMU 10) be examined either by excavation or borings to determine if there were drums buried there and, if so, what the contents were and what impact they had on the groundwater. It was also pointed out that inadequate groundwater monitoring wells existed downgradient of the area to determine the extent and concentration of any contaminants migrating into the public access area immediately southwest of the facility. OEPA correspondence dated June 22, 1982 indicated the possibility that buried optical brighteners waste could also be the cause of the contamination in the Former Swale Area (SWMU 10).

In 1982, an EPA-tasked FIT performed a site inspection at the Morton facility. The FIT confirmed that groundwater contamination at the Former Surface Impoundments (SWMU 1) was a likely source of the stained groundwater seepage along the banks of Mill Creek.

No chemical spills occurred at the site between 1983 and 1991, according to Glenn Schaaf, Manager of Health, Safety, and Environmental for Morton.

In 1985, a Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) were installed at the Morton facility in order to minimize off-site migration of contaminated groundwater. The Groundwater Collection System (SWMU 6), made up of a French drain, an extraction well, and a collection sump, was designed to collect contaminated groundwater from the Former Surface Impoundments (SWMU 1) area and the Former Swale Area (SWMU 10). After collection, water was treated in the Groundwater Treatment Unit (SWMU 7) and discharged to the MSD.

On October 1 and 2, 1990, an EPA-tasked FIT performed site reconnaissance and a Screening Site Investigation (SSI) at the Morton facility. A dry, crystalline substance was observed on the bank of Mill Creek adjacent to the Morton facility. Analysis of this substance revealed a number of contaminants, including carbon disulfide, ethylbenzene, xylenes, chlorobenzene, and

III. SOLID WASTE MANAGEMENT UNITS

This section presents descriptions of the SWMUs identified during the PA and VSI at the Morton facility. Photograph numbers correspond to those presented in the Visual Site Inspection Photograph Log in Appendix A. The SWMU locations are shown in the figure presented in Appendix C.

TABLE III-1
Solid Waste Management Units and Areas of Concern
Morton International, Inc., Reading, Ohio

SWMU/AOC	Name	Release Potential
SWMU 1	Former Surface Impoundments	High
SWMU 2	Former Neutralization Tank	Low
SWMU 3	Former Drum Storage Area	Moderate
SWMU 4	Hazardous Waste Drum Storage Area	Low
SWMU 5	Former Sulfide Waste Treatment Tank	Low
SWMU 6	Groundwater Collection System	Low
SWMU 7	Groundwater Treatment Unit	Low
SWMU 8	Satellite Waste Accumulation Areas	Low
SWMU 9	pH Control System	Low
SWMU 10	Former Swale Area	High
SWMU 11	Combined Sewer System	Moderate

SWMU 1 - Former Surface Impoundments

Report Photograph No(s): 1, 2, 3

Log Book Photograph No(s).: 8, 9, 11

Period of Operation: 1950 to various dates (see below)

Location: The Former Surface Impoundments were located outdoors, in the northwest corner of the Morton facility.

Physical Description: This unit consisted of six unlined ponds. Each pond was approximately 2,500 square feet in area and five to six feet deep.

The three westernmost ponds contained crushed dolomite stone to neutralize acid wastes. After neutralization, liquids were pumped through two settling ponds located immediately east of the neutralizing ponds. The remaining liquid was discharged into the sixth pond and allowed to evaporate.

The westernmost pond was filled with clean soil in 1970. The next westernmost pond was filled with reportedly clean soil in 1974. The easternmost neutralization pond and two settling ponds were filled with reportedly clean soil and capped with a 6-inch layer of concrete in 1979. The last remaining pond was dredged and filled with reportedly clean soil in 1980, at which time all pond treatments were discontinued at the Morton facility. The Former Surface Impoundments (SWMU 1) area is currently covered with asphalt pavement and is used for loading and unloading.

Wastes Managed: The Former Surface Impoundments (SWMU 1) were used to treat wastewaters produced in the manufacture of benzophene. Correspondence from Cincinnati Milacron, dated November 20, 1979, approximated discharge to the impoundments at the following:

- 910 gallons per day (gpd) hydrochloric acid
- 11 gpd dilute sulfuric acid
- 31 gpd methanol
- 6 gpd resorcinol
- 3 gpd benzoic acid

The wastewater also contained low levels of heavy metals, waste oils, and chloral benzene compounds that subsequently degraded to other organic compounds such as 1,2-dichlorobenzene and chlorobenzene.

SWMU 1 - Former Surface Impoundments (Continued)

An undated document included with a 1988 reference document listed additional wastes that were discharged to the Former Surface Impoundments, including:

- Scrubber system discharge containing sulfuric acid, myristal lauyl, steryl alcohol, acrylonitrile, chlorine, and sulfur
- C-700 Centrifuge discharge containing hydrochloric acid, sodium bicarbonate, and fumes from the "benzotrichloride vent scrubber"
- Reactor clean outs
- C-700 Wet centrifuge discharge containing isopropyl alcohol (IPA) and benzophenones
- Sulfuric acid residues from the "MDAC process."

According to Morton representatives, product lines were dropped or manufacturing processes changed, which resulted in the elimination of all the waste streams described above in the early to mid 1980s.

History of Releases: In 1979 the Morton facility (along with neighboring facilities Pristine, Inc. and Cincinnati Drum Service) was investigated after OEPA observed discolored ground water leaching from the east bank of the Mill Creek, near the location of the Former Surface Impoundments.

A December 9, 1981 report from a Carstab contractor noted that a composite groundwater seepage sample from the Former Surface Impoundments area contained elevated levels of the following materials: organic substances, phenol, various dichlorobenzenes, and arsenic. Chloride, sulfate, and ammonia nitrogen were also detected at somewhat elevated concentrations.

In 1984, Carstab installed a Groundwater Collection System (SWMU 6) along the western site boundary. The purpose of the Groundwater Collection System (SWMU 6) was to collect contaminated groundwater from the Former Surface Impoundments area and the Former Swale Area (SWMU 10) before it discharged into Mill Creek.

In October 1990, FIT groundwater sampling showed chlorobenzene (14 to 56 µg/l), 1,2-dichlorobenzene (12 µg/l), arsenic (32.7 µg/l), manganese (739 µg/l), and vanadium (660 µg/l) contamination in the area of the Former Surface Impoundments (SWMU 1). However, the results could not be definitively attributed to the Morton facility because suitable background sampling points for groundwater were not available. Soil and sediment samples revealed contamination above background levels, with the highest detections coming from the Former Surface Impoundments (SWMU 1) area. The soil sample in the Former Surface Impoundments (SWMU 1) area was collected at a depth of 7 feet and contained elevated levels of chlorobenzene (12,000 µg/kg), toluene (5,000 µg/kg), ethylbenzene (1,600 µg/kg), and total xylenes (10,000 µg/kg) (Note: these values were described in the report as "estimated"). The SVOC

SWMU 1 - Former Surface Impoundments (Continued)

1,2-dichlorobenzene was detected at 3,300,000 µg/kg, along with the detection of other SVOCs and TICs. Another sample from the Former Surface Impoundments (SWMU 1) area showed similar results, indicating a likely relationship between the Former Surface Impoundments (SWMU 1) and the contamination on the banks of Mill Creek.

During a 1993 ESI, analytical results again indicated contamination originating from the Former Surface Impoundments (SWMU 1). Groundwater samples from two monitoring wells located hydraulically downgradient of the Former Surface Impoundments (SWMU 1) area were analyzed. The samples from one well (MW-EPA-1) contained the following contaminants at concentrations significantly above background levels: acetone, chlorobenzene, benzene, ethylbenzene, toluene, xylenes, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and nickel. The samples from the second well (MW-5), contained significant concentrations of chlorobenzene. Groundwater samples taken from wells upgradient and/or lateral to the Former Surface Impoundments (SWMU 1) area and from wells between the former impoundments and potential off-site sources did not contain significant concentrations of the above-mentioned contaminants.

The monitoring well installation and sampling discussed in the previous paragraphs pertain to investigation of the shallow aquifer underlying the Morton facility. It does not appear, based on available file materials and discussions with Morton representatives, that potential releases to the deeper aquifer have been investigated.

Additional information on groundwater contamination at the facility is provided in the description of the Groundwater Collection System (SWMU 6).

Potential for Past/Present Release:

High (X)
Moderate ( )
Low ( )

Conclusions: As described above, the Former Surface Impoundments (SWMU 1) are a source of hazardous constituents to soil, groundwater and sediments in Mill Creek. Although it appears that the most effective long-term solution to the contamination problem would be to remove or treat the source of the contamination (e.g., soil vapor extraction or source excavation), as long as the current Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) continue operations, the contamination may be confined to the Morton site. However, Morton is under no orders or agency obligation to continue groundwater extraction and treatment. Therefore, it is recommended that U.S. EPA and/or OEPA continue correspondence with Morton to ensure that the Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) continue to function effectively for a sufficient period of time.

SWMU 1 - Former Surface Impoundments (Continued)

In addition, since it appears that deeper portions of the aquifer may be used for domestic purposes, it is recommended that Morton investigate potential contamination in the deeper portions of the aquifer, due to potential releases from the Former Surface Impoundments.

Furthermore, it is recommended that sediments in Mill Creek be investigated to determine the extent of impacts from the past contaminated leachate releases.

SWMU 2 - Former Neutralization Tank

Report Photograph No(s): 4, 5

Log Book Photograph No(s).: 3, 2

Period of Operation: The tank was used to manage waste from the 1980s to approximately 1993, but is currently used for product storage.

Location: This unit is located outdoors, in the northeastern section of the property.

Physical Description: The Former Neutralization Tank (SWMU 2) is a 10,000-gallon fiberglass tank. Several other aboveground storage tanks are located in this area, but reportedly only the Former Neutralization Tank (SWMU 2) was used to manage waste. The Former Neutralization Tank (SWMU 2) and the other tanks are situated on a concrete pad and are diked for secondary containment. The structural integrity of the unit and the surrounding secondary containment appeared intact during the VSI.

Wastes Managed: The Former Neutralization Tank (SWMU 2) was used for storage of low pH wastewater generated by various processes at the facility. Wastewater was neutralized in the tank then discharged into the sanitary sewer system. Beginning in March 1993, the pH Control System (SWMU 9) was used to neutralize wastewaters prior to discharge.

History of Releases: No releases were identified through review of available reference materials or during the PA/VSI.

Potential for Past/Present Release:

High ( )
Moderate ( )
Low (X)

Conclusions: No further investigation appears necessary, since there is no evidence of a spill or release and the tank and secondary containment appeared to be intact at the time of the VSI.

SWMU 3 - Former Drum Storage Area

Report Photograph No(s): 2, 6

Log Book Photograph No(s).: 9, 10

Period of Operation: According to facility representatives, the Former Drum Storage Area (SWMU 3) was used from 1980 to 1990. However, in correspondence dated December 5, 1991, a Morton representative stated that usage of the Former Drum Storage Area would end on January 1, 1992.

Location: This area is located outdoors, in the northwest corner of the site.

Physical Description: The Former Drum Storage Area (SWMU 3) is a concrete storage pad which was used for the temporary (less than 90-day) storage of drums containing solid and hazardous wastes. The dimensions of the unit are approximately 160 feet by 50 feet. The area contains some curbing as secondary containment. This area was reportedly cleaned when the transition was made from storing waste in the Former Drum Storage Area (SWMU 3) to storage in the current Hazardous Waste Drum Storage Area (SWMU 4). During the VSI, it was noted that the concrete pad contained several cracks.

According to facility representatives, the drums of solid and hazardous wastes were stored "on a paved area" prior to 1980. However, additional information was requested but not provided by Morton regarding drum management prior to 1980.

Wastes Managed: According to facility representatives, flammable wastes (D001), TCLP wastes (D002, D003, D004, D006 and D008) from various processes, and listed wastes (F003, F005) were stored at this unit. Wastes were subsequently shipped off site. During the 1991 FIT SSI, 150 55-gallon drums containing liquid hazardous wastes were observed in the Former Drum Storage Area (SWMU 3). A list of hazardous wastes generated at the facility between 1981 and 1990 is presented in Appendix D. Also during the 1991 FIT investigation, approximately 25 cardboard boxes containing solid waste were noted at the unit. The boxes were plastic-lined, approximately one cubic yard in size, and labeled "CECOS."

History of Releases: No releases were identified through review of available reference materials or during the VSI. However, the concert pad was observed to contain several cracks.

Potential for Past/Present Release:

High ( )
Moderate (X)
Low ( )

SWMU 3 - Former Drum Storage Area (Continued)

Conclusions: The fact that the concrete is cracked, the area was used to store relatively large quantities of hazardous wastes, and the unit is not protected from the elements leads to a moderate potential for release. Sampling is recommended for the soil beneath the Former Drum Storage Area (SWMU 3) to determine whether releases of hazardous constituents occurred.

SWMU 4 - Hazardous Waste Drum Storage Area

Report Photograph No(s): 7

Log Book Photograph No(s).: 18

Period of Operation: 1992 to present

Location: This area is located in the west central portion of the site.

Physical Description: The Hazardous Waste Drum Storage Area (SWMU 4) is a 40 foot by 40 foot building on a concrete pad. Three of the walls are metal, and the fourth is made of a clear plastic material. The roof directs storm water into storage tank dikes located immediately north of the unit. The floor surface area of the Hazardous Waste Drum Storage Area (SWMU 4) is contained by the walls and a trench system, which prevent spills and leaks from migrating to the environment.

Wastes Managed: This unit is used for the less-than-90-day storage of drums containing various liquid hazardous wastes such as by-product methanol (D001), acetic acid (D001), and other D-listed wastes (D002, D004, D007 and D008) produced by assorted processes at the Morton facility. Morton representatives also indicated that laboratory solvents (F003 and F005 hazardous wastes) are also managed in the unit. Approximately 30-40 drums of D001 waste and one half drum of D-listed wastes are reportedly produced each month (quantity of F-listed wastes not specified by Morton representatives). Drums are subsequently shipped off site for disposal.

History of Releases: No releases were identified through review of available reference materials or during the PA/VSI.

Potential for Past/Present Release:

High ( )
Moderate ( )
Low (X)

Conclusions: No further investigation appears necessary, since the Hazardous Waste Drum Storage Area (SWMU 4) is covered, contained by walls and a trench system, and there is no evidence of a spill or release from the unit.

SWMU 5 - Former Sulfide Waste Treatment Tank

Report Photograph No(s): 8

Log Book Photograph No(s).: 7

Period of Operation: 1980 to 1986 or 1987

Location: This unit is located outdoors in the northeast portion of the site, at the end of the railroad spur that enters the property.

Physical Description: The Former Sulfide Waste Treatment Tank (SWMU 5) is a 10,000-gallon steel aboveground storage tank on a concrete pad. The unit is the northernmost of a group of five aboveground tanks, and is reportedly the only tank in the group that was used for storing wastes. The unit is currently used for storing fuel oil, and its structural integrity appeared intact at the time of the VSI. Secondary containment in the form of concrete curbing was installed in approximately 1992.

Wastes Managed: The Former Sulfide Waste Treatment Tank (SWMU 5) was used to contain high pH wastewater generated by the sulfurizing of fats and oils. Approximately 40,000 gallons of this waste was generated yearly. The waste was periodically shipped off site for disposal.

History of Releases: No releases were identified through review of available reference materials or during the PA/VSI.

Potential for Past/Present Release:

High ( )
Moderate ( )
Low (X)

Conclusions: No further investigation appears necessary, since the structural integrity of the tank appeared intact and there is no evidence of a spill or release from the unit.

SWMU 6 - Groundwater Collection System

Report Photograph No(s): 9, 10, 11, 12

Log Book Photograph No(s).: 16, 15, 12, 17

Period of Operation: 1985 to Present

Location: The Groundwater Collection System (SWMU 6) is made up of four components: a French drain, an extraction well, and a collection sump and a slurry wall. The French drain runs along the northwestern boundary of the site, near the location of the Former Surface Impoundments (SWMU 1). The extraction well is located in the southwestern area of the facility, in the Former Swale Area (SWMU 10). The collection sump is located below the ground surface in the west central portion of the facility.

Physical Description: The French drain runs for 750 feet along the northwestern boundary of the site, at a depth of approximately 20 feet. It is constructed of corrugated plastic pipe, eight inches in diameter, and is covered with gravel. The extraction well is four inches in diameter and is operated with a submersible pump. A concrete slurry wall was installed along the northern border of the site to eliminate the formation of a hydraulic sink at the Morton facility, which would pull groundwater from the adjacent Cincinnati Drum Service facility. The French drain and extraction well direct groundwater to the collection sump, which is constructed of concrete. From the collection sump, the groundwater is pumped to the Groundwater Treatment Unit (SWMU 7).

Wastes Managed: The purpose of the unit is to prevent contaminated groundwater from migrating off the site and into Mill Creek. Groundwater from the Former Surface Impoundments (SWMU 1) area, collected by the French drain, and groundwater from the Former Swale Area (SWMU 10), collected by the extraction well, mixes together in the collection sump.

As detailed in the descriptions of SWMUs 1 and 10, high concentrations of hazardous constituents have been detected in groundwater samples from monitoring wells located near the Former Surface Impoundments (SWMU 1) and in the Former Swale Area (SWMU 10). Contaminated groundwater from those areas makes up the majority of the water collected by the Groundwater Collection System (SWMU 6). The most recent analytical data in the available references on samples of water from the unit are from 1992. Water samples were collected and analyzed in March 1992 by a Morton contractor, and in September 1992 by an U.S. EPA contractor. Selected contaminants detected in groundwater by the Morton and U.S. EPA contractors are summarized in Table III-2. Note that some contaminants, including benzene, chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene, have been detected at concentrations near or exceeding the corresponding MCL.

TABLE III-2
SELECTED CONTAMINANTS DETECTED IN COLLECTED GROUNDWATER AT MORTON

Parameter/ Contaminant	Morton Contractor Results March 1992			EPA Contractor Results September 1992	MCL (mg/l)
	Average Conc. (mg/l)	Minimum Conc. (mg/l)	Maximum Conc. (mg/l)	Maximum Conc. (mg/l)	
1,1-Dichloroethane[a]	0.011	0.008	0.013	0.007	--
Benzene[a]	0.003	0.002	0.004	0.004	0.005
Toluene[a]	0.071	0.043	0.089	0.100	1
Chlorobenzene[a]	0.060	0.043	0.076	0.160	0.1
Ethylbenzene[a]	0.006	0.005	0.007	0.014	0.7
Total Xylenes[a]	0.015	0.010	0.018	0.064	10
1,2-Dichlorobenzene[b]	0.323	0.240	0.390	0.590	0.6
1,3-Dichlorobenzene[b]	0.008	0.005	0.010	0.016	--
1,4-Dichlorobenzene[b]	0.032	0.005	0.057	0.082	0.075
Arsenic			NR[c]	0.0248	0.05
Nickel			0.021	ND[d]	0.1

[a] VOC
[b] SVOC
[c] NR=Not reported
[d] ND=Not detected

History of Releases: No releases were identified through review of available reference materials or during the PA/VSI.

Potential for Past/Present Release: **High ( )**
Moderate ( )
Low (X)

Conclusions: As discussed in the conclusions for the Former Surface Impoundments (SWMU 1), Morton is under no orders or agency obligation to continue groundwater extraction and treatment. Therefore, it is recommended that the U.S. EPA and/or OEPA continue

SWMU 6 - Groundwater Collection System (Continued)

correspondence with Morton to ensure that the Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) function effectively for an appropriate period of time.

SWMU 7 - Groundwater Treatment Unit

Report Photograph No(s): 13

Log Book Photograph No(s).: 20

Period of Operation: 1985 to Present

Location: This unit is located indoors in the northwestern corner of the site, south of the Former Surface Impoundments (SWMU 1).

Physical Description: The Groundwater Treatment Unit (SWMU 7) is constructed of steel and concrete. Groundwater recovered by the Groundwater Collection System (SWMU 6) flows into the Groundwater Treatment Unit (SWMU 7) and passes through a totalizing flow meter and pH meter. These instruments send a signal to the controller, which sends a proportional signal to a hydrogen peroxide pump. Hydrogen peroxide is then added in order to oxidize the sulfur-containing materials in the water, thus preventing the possibility of a sulfide release.

Until 1992 the treated water was discharged to the MSD. In 1992 additional steps were added to the treatment system, in order to allow the groundwater to be used as make-up water in the facility's non-contact cooling system. The added steps consisted of a solids (bag) filter followed by several carbon adsorption drums. According to facility representatives, all of the treated water from the Groundwater Treatment Unit (SWMU 7) is currently added to the non-contact cooling system. Facility representatives also indicated that the non-contact cooling system water is lost through evaporation or inadvertent overflow.

Wastes Managed: This unit manages contaminated groundwater collected by the Groundwater Collection System (SWMU 6). See SWMU 6 for a listing of contaminants which have been detected in the collected groundwater. According to Morton representatives, untreated and treated groundwater samples are analyzed bimonthly for "the organic chemicals covered by Morton's wastewater discharge permit, i.e., OCPSF regulated materials." Hazardous constituents generally seen before treatment through the activated carbon include: chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, ethylbenzene and toluene. Morton representatives indicated that the untreated groundwater was analyzed in April, 1998, and the following concentrations were detected: chlorobenzene (203 ppb), 1,2-dichlorobenzene (613 ppb), 1,3-dichlorobenzene (19.8 ppb) 4-dichlorobenzene (97.1 ppb), ethylbenzene (7.6 ppb) and toluene (135 ppb). According to Morton representatives, the concentrations are "normally below the detection limit" after treatment. The Groundwater Treatment Unit (SWMU 7) was also used to treat groundwater that seeped into excavated areas during the construction of the pH Control System (SWMU 9) in late 1992 and early 1993.

Wastes produced by the Groundwater Treatment Unit include spent bag filters, which are sent off-site for disposal, and spent carbon, which is also sent off site for reactivation and reuse.

SWMU 7 - Groundwater Treatment Unit (Continued)

History of Releases: No releases were identified through review of available reference materials or during the PA/VSI. However, according to facility representatives, water is released from the non-contact cooling system through evaporation and inadvertent overflow. Thus, contaminants remaining in the treated water after its addition to the non-contact cooling system could potentially be released.

Potential for Past/Present Release:

High ( )
Moderate ( )
Low (X)

Conclusions: The only apparent potential for release from this unit is if groundwater contaminants are not properly treated prior to the water being added to the facility's non-contact cooling system. The facility is not currently required by OEPA to monitor its collected and treated groundwater. In order to ensure that contaminants are not being released, a scheduled effluent testing program should be required to ensure that contaminants do not remain in the treated water which could be released via the non-contact cooling system.

SWMU 8 - Satellite Waste Accumulation Areas

Report Photograph No(s): 14, 15

Log Book Photograph No(s).: 1, 4

Period of Operation: 1982 to Present

Location: The Morton facility has five Satellite Waste Accumulation Areas (SWMU 8), located indoors in Buildings 3, 4, 6, 11/12, and 27. During the VSI, two representative Satellite Waste Accumulation Areas, located in the east central portion of the facility, were directly observed.

Physical Description: Each Satellite Waste Accumulation Area (SWMU 8) contains a 55-gallon drum on a concrete surface with no secondary containment. No signs of release were noted at the two representative units observed. Morton uses a "WIXEL" PC-based Waste Label Generation tracking system in order to label each drum per RCRA regulations. When full, drums are transferred to the Hazardous Waste Drum Storage Area (SWMU 4) for less than 90-day storage.

Wastes Managed: According to facility representatives, the following hazardous wastes are managed at the Satellite Waste Accumulation Areas: D001, D004, D007, D008, F003 and F005.

History of Releases: No releases were identified through review of available reference materials or during the PA/VSI.

Potential for Past/Present Release:

High ( )
Moderate ( )
Low (X)

Conclusions: No further investigation appears necessary, since all the Satellite Waste Accumulation Areas (SWMU 8) are located over concrete surfaces and there is no evidence of past or present spills or releases from the units.

SWMU 9 - pH Control System

Report Photograph No(s): No photograph available

Log Book Photograph No(s).: No photograph available

Period of Operation: 1993 to Present

Location: The unit is located in the west central area of the facility.

Physical Description: The pH Control System (SWMU 9) consists of two mechanically agitated sumps. The sumps are constructed of poured, reinforced concrete, and are lined on the interior by a polymeric lining. Wastewater enters the first sump and the pH of the wastewater is measured. Automatic controls release the proper amount of caustic or acid needed to reach the allotted pH range (6-10 pH units). The wastewater is then transferred to the second sump and discharged to the MSD.

Morton representatives indicated during the VSI and in subsequent correspondence that the MSD requires that the wastewater effluent be discharged at a pH between 6 and 10. However, Morton representatives did not specifically state whether a permit exists for the discharges.

Wastes Managed: This unit manages facility wastewater from specialty chemical process streams, wash down, cooling water, boiler plant blowdown, sanitary waste and storm water runoff. These waste streams are transferred to the unit by the Combined Sewer System (SWMU 11). The constituents of the wastewater were not identified in the available file materials and could not be provided by facility representatives.

History of Releases: No releases were identified through review of available reference materials or during the PA/VSI.

Potential for Past/Present Release:
High ( )
Moderate ( )
Low (X)

Conclusions: The sumps comprising this unit are constructed of concrete and are lined. Therefore the potential for release from the sumps is low. The effluent from the unit is regulated by the MSD, although Morton did not state whether the effluent discharge to the MSD is currently permitted.

SWMU 10 - Former Swale Area

Report Photograph No(s): 12

Log Book Photograph No(s).: 17

Period of Operation: Unknown

Location: The unit is located in the south central area of the facility beneath the current employee parking lot.

Physical Description: At one time, the Former Swale Area (SWMU 10) was a topographic depression, or swale, which was reportedly used for the disposal of various solid and liquid wastes. The extent of the disposal area is unknown, but based on historic aerial photographs it appears to have been confined to a relatively small area.

Wastes Managed: The Former Swale Area may have been used as a dumping area as early as pre-1950, when the property was part of a working dairy farm. In the early 1950's, this area may have been used for the disposal of lime sludge by Carlisle Chemical Works. The Former Swale Area (SWMU 10) was reportedly filled with debris from a demolished farmhouse and barn in the 1960's. OEPA correspondence dated June 22, 1982 indicated the possibility that buried optical brighteners waste could be a source of contamination in the Former Swale Area (SWMU 10). Disposal of drums of waste (type of waste not specified) at this unit has been alleged, but not confirmed.

History of Releases: The Former Swale Area (SWMU 10) was first investigated by OEPA in August 1979 after a former employee of Cincinnati Milacron, who was involved in an occupational exposure lawsuit against the company, alleged that drums of waste had been buried in the unit. In June, 1980, OEPA conducted a survey with a metal detector in the parking lot area and found indications of a large subsurface concentration of metal. The metal could not be identified as any specific object, such as drums.

A groundwater sample from a monitoring well near the Former Swale Area (SWMU 10), discussed in a December 9, 1981 report from a Morton contractor, contained elevated concentrations of organic compounds, illustrated by the levels of TOC (1,084 mg/l), acid extractable organics (25,000 µg/l), and base/neutral extractable organics (416,000 µg/l). The samples also contained elevated levels of arsenic (132 µg/l), chromium (10.6 µg/l), lead (18.2 µg/l), and ammonia nitrogen (2,240 mg/l). Contamination from the Former Swale Area (SWMU 10) reportedly did not appear to be migrating significantly toward Mill Creek (the direction of groundwater flow) at that time.

SWMU 10 - Former Swale Area (Continued)

In 1984, Carstab installed the Groundwater Collection System (SWMU 6) which included an extraction well in the Former Swale Area (SWMU 10). This purpose of the extraction well was to remove contaminated groundwater from the Former Swale Area (SWMU 10) before it could reach Mill Creek.

During the 1993 ESI, acetone (22 µg/l), chlorobenzene (150 µg/l), 1,2-dichlorobenzene (11 µg/l), nickel (44 µg/l), and vanadium (71.8 µg/l) were detected at concentrations significantly above background levels in the samples from the monitoring well in the Former Swale Area (SWMU 10). These results, in light of the absence of significant concentrations of contamination found in wells located upgradient to the monitoring well in the Former Swale Area (SWMU 10), give a strong indication that contamination in that monitoring well is originating from the vicinity of the Former Swale Area (SWMU 10).

Potential for Past/Present Release: **High (X)**
Moderate ( )
Low ( )

Conclusions: As described above, the Former Swale Area appears to be a source of hazardous constituents detected in groundwater. Although it appears that the most effective long-term solution to the contamination problem would be to remove or treat the source of the contamination (e.g., soil vapor extraction or source excavation), as long as the current Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) continue operations, the contamination may be confined to the Morton site. However, Morton is under no orders or agency obligation to continue groundwater extraction and treatment. Therefore, it is recommended that U.S. EPA and/or OEPA continue correspondence with Morton to ensure that the Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) function effectively for an appropriate period of time.

Furthermore, since it appears that deeper portions of the aquifer may be used for domestic purposes, it is recommended that Morton investigate potential contamination in the deeper portions of the aquifer, due to potential releases from the Former Swale Area.

SWMU 11 - Combined Sewer System

Report Photograph No(s): No photograph available

Log Book Photograph No(s).: No photograph available

Period of Operation: Unknown

Location: The Combined Sewer System is located in the process areas of the facility. Exact locations were requested from, but not provided by facility representatives.

Description: The Combined Sewer System (SWMU 11) is a combined sanitary, stormwater and process wastewater system that flows to the pH Control System (SWMU 9). Prior to the installation of the pH Control System in 1993, the Combined Sewer System (SWMU 11) discharged directly to the MSD. There is a potential that portions of this unit also discharged to the Former Surface Impoundments (SWMU 1) although this discharge point was not identified or confirmed by Morton representatives.

The Combined Sewer System (SWMU 11) was identified by a reference document dated November 19, 1982, which lists four floor trenches and two weir pits at the Morton facility. Information provided by Morton representatives on the locations of and wastes managed in the Combined Sewer System (SWMU 11) is presented in Table IV-1. No description of the size, construction or extent of the trenches or weirs was given in the reference, and the Combined Sewer System (SWMU 11) was not observed during the VSI. In addition, it is not known how the trenches and weir pits are connected to the pH Control System (e.g., via underground piping) since Morton representatives provided no further information on the unit.

Wastes Manages: The wastes that are known to be managed in the Combined Sewer System (SWMU 11) are presented in Table III-3. Sanitary wastes and storm water are also managed in the unit. There is a potential that stormwater managed in the unit could contain low concentrations of VOCs, SVOCs and metals.

History of Releases: No releases were identified through review of available reference materials. However, the trenches and weir pits that manage the process waste water were not observed during the VSI. Further, the units are below grade, so the integrity of the units could probably not be verified through visual inspection at the surface.

Potential for Past/Present Release: **High ( )**
Moderate (X)
Low ( )

TABLE III-3
LOCATIONS OF AND WASTES MANAGED BY THE COMBINED SEWER SYSTEM (SWMU 11)

Location	Segment	Wastes Managed	
Building 1	Floor Trench	50-90%	Mixture of fatty acid, amide-amines, paraffin waxes, thiodipropionate esters, and C_{12}, C_{14}, C_{16}, C_{18} alcohols and carboxylic acids.
		10-50%	Soil
Building 2	Floor Trench	50-90%	Mixture of animal fat, fatty acid, alcohols (C_{10} -C_{18}), cotton seed oil, petroleum sulfonate, fatty acid amide-amines, thiodipropionate esters, C_{10}, C_{12}, C_{14}, C_{16}, C_{18} methanone, 2-hydroxy-4-octyloxy phenol
		10-50%	Soil
Building 3-3A	Floor Trench	50-90%	Mixture of isooctyl thioglycolate, organotin mercaptides and 2-mercapto-ethyl oleates
		10-50%	Soil
Building 5	Floor Trench	50-90%	Mixture of paraffin waxes and ethylene bis stearamide wax
		10-50%	Soil
Building 1	Weir Pit	50-90%	Mixture of fatty acid, amide-amines, paraffin waxes, thiodipropionate esters, and C_{12}, C_{14}, C_{16}, C_{18} alcohols and carboxylic acids.
		10-20%	Soil
		10-20%	Matter
Building 3	Weir Pit	20-60%	Water
		20-80%	Inorganic Inert Material
		0-1%	Trace Organics

SWMU 11 - Combined Sewer System (Continued)

Conclusions: Morton provided the VSI Team with very little information regarding the Combined Sewer System. Therefore, the construction, integrity and overall release potential of the units' components are unknown. It is suggested that Morton provide additional information regarding this unit as part of the Corrective Action process, including:

- Construction of all unit components
- Location of each component, including all buried sewers
- Wastes managed in each component of the unit
- Historical discharge point(s) for the sewer system (if any)
- Results of integrity testing (if any) conducted on the unit

IV. AREAS OF CONCERN

No Areas of Concern (AOCs) were identified during the PA/VSI at the Morton facility.

V. CONCLUSIONS

Based on observations made during the VSI and analytical results of groundwater and soil sampling conducted at the facility, further investigations or actions under Corrective Action Authorities appear warranted for five SWMUs. It is recommended that the further actions under Corrective Action Authorities described below be coordinated with any OEPA-approved plans.

An investigation is suggested for this facility as outlined below:

- Morton is under no orders or agency obligation to continue operations of the Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7). Since these units contain and treat contaminated shallow groundwater generated by the Former Surface Impoundments (SWMU 1) and Former Swale Area (SWMU 10), it is recommended that the U.S. EPA and/or OEPA continue correspondence with Morton to ensure that the Groundwater Collection System (SWMU 6) and Groundwater Treatment Unit (SWMU 7) continue to operate effectively for an appropriate period of time.

- Since it appears that deeper portions of the aquifer may be used for domestic purposes in the vicinity of the Morton facility, it is recommended that Morton investigate potential contamination in the deeper portions of the aquifer, due to potential releases from the Former Surface Impoundments (SWMU 1) and Former Swale Area (SWMU 10).

- It is recommended that sediments in Mill Creek be investigated to determine the extent of impacts from past contaminated leachate releases associated with the Former Surface Impoundments (SWMU 1).

- Morton should establish a scheduled effluent testing program at the Groundwater Treatment Unit (SWMU 7) to ensure that hazardous constituents do not remain in the treated water which could be released via the non-contact cooling system.

- Information on the Combined Sewer System (SWMU 11) should be provided by the Morton facility in order to determine what further actions are warranted for the unit. Specific information that should be provided is included in the unit description in Section III.

APPENDIX B
Visual Site Inspection Field Notebooks

APPENDIX A
Photograph Log

VISUAL SITE INSPECTION FIELD NOTEBOOKS

FOR

MORTON INTERNATIONAL
CINCINNATI, OHIO

SECTIONS

I verify that the following data sheets have been signed by corresponding field personnel and have been numbered immediately following this inspection.

Signature: Kirk Higgins **Date/Time:** 5/12/98 16:00

Total Pages: (16)

I. INTRODUCTORY MEETING

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	1 of 16

Personnel Present — Time 13:15

VSI Team: Kevin Higgins
Kristen White

Facility Representatives: (See Business cards)

State Representative: None Present

Topics Addressed

Purpose of VSI: ☑ Yes – Discussed authority of RCRA on-site

List of SWMUs/AOCs: ☑ Yes

Health and Safety: ☑ Hard hat, steel-toed, safety-glasses; escorted @ all times

Transportation on Site: ☑ Walking Tour

Other: ☑ None

Notes:

KH

Signature: Kir R Higgins

IV. UNDERGROUND STORAGE TANKS

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	2 of 16

Time 15:15

(2) UST Location Identified as "G" on Map KRH Product Stored Fuel Oil

Capacity (2) 12,000 gallon Installed (yr) Unknown Construction Steel

Closure Status/Date 1990 - Removed - Closed thru. State Fire Marshall's Office

UST Location Identified as "A" on Map KRH Product Stored Gasoline

Capacity 300 gallon Installed (yr) Unknown Construction Steel

Closure Status/Date 1990 - Removed/Closed thru. State Gasoline used for site forklifts

UST Location _____ Product Stored _____

Capacity _____ Installed (yr) _____ Construction _____

Closure Status/Date _____

UST Location _____ KRH Product Stored _____

Capacity _____ Installed (yr) _____ Construction _____

Closure Status/Date _____

Notes: _____

KRH

Signature: Kim R Higgins

V. SOLID WASTE MANAGEMENT UNITS

(A) Satellite Accumulation Points

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	3 of 16

Time 14:10

- ☐ Active/Former/Closed Unit: Active Unit
- ☐ Period of Operation: 1982 to present
- ☐ Generating Process: Process filters (from Methyl Tin Intermediate)
- ☐ Waste Managed/Code: Process Filters - TCLP Metals (D-Listed)
- ☐ Generation Rate: 1/2 Drum/Month
- ☐ Disposition of Waste: Haz Waste Storage
- ☐ Dimensions/Capacity: 55-gallon drum
- ☐ Materials of Construction: plastic drum
- ☐ Secondary Containment: No
- ☐ Visual Evidences of Release: No
- ☐ Structural Integrity of Unit: O.K.
- ☐ Documented Releases: No
- ☐ Corrective Action: None
- ☑ Location Identified on Map
- ☑ Photograph Taken

Notes: - Facility uses combined sewer system
- Sumps pump to nuetralization tanks (w/in buildings)
- (second Acetic acid waste stream - in Building 6 - D001; generation varies

Signature: Kim Higgins

V. SOLID WASTE MANAGEMENT UNITS

(B) Former Nuetralization Tank (2)

Facility:	Morton International
City/State:	Cincinnati, Ohio
Date:	May 12, 1998
Page	4 of 16

Time 14:15

- ☐ Active/Former/Closed Unit: Former Tank/currently used for product
- ☐ Period of Operation: 1980's – 1992 or 3 (2) not known
- ☐ Generating Process: Various Processes
- ☐ Waste Managed/Code: High KRH Low pH Wastewater
- ☐ Generation Rate: Unknown
- ☐ Disposition of Waste: Discharged to sewer district
- ☐ Dimensions/Capacity: 10,000 gallon
- ☐ Materials of Construction: Fiberglass
- ☐ Secondary Containment: Diked concrete
- ☐ Visual Evidences of Release: None
- ☐ Structural Integrity of Unit: O.K.
- ☐ Documented Releases: None
- ☐ Corrective Action: No
- ☑ Location Identified on Map
- ☑ Photograph Taken

Notes: KRH

Signature: Kim Rathgeber

V. SOLID WASTE MANAGEMENT UNITS

(c) Former sulfide Waste Treatment Tank

Facility:	Morton International
City/State:	Cincinnati, Ohio
Date:	May 12, 1998
Page	5 of 16

Time 14:20

- ☐ Active/Former/Closed Unit — Former Unit / current Fuel Oil
- ☐ Period of Operation — 1980 - Mid 80's ('86-'87)
- ☐ Generating Process — Sulfurizing Fats/Oils
- ☐ Waste Managed/Code — ~~Low pH~~ KRH High pH wastewater
- ☐ Generation Rate — 40,000/year
- ☐ Disposition of Waste — ~~Discharged~~ KRH Shipped offsite
- ☐ Dimensions/Capacity — 10,000 Tank
- ☐ Materials of Construction — Steel
- ☐ Secondary Containment — Yes
- ☐ Visual Evidences of Release — No
- ☐ Structural Integrity of Unit — O.K.
- ☐ Documented Releases — No
- ☐ Corrective Action — None
- ☒ Location Identified on Map
- ☑ Photograph Taken

Notes: - Load/Unload area — 2nd containment ment in x 1992

-

Signature: Kirk Hoggins

V. SOLID WASTE MANAGEMENT UNITS

(D) Former Surface Impoundments

Facility:	Morton International
City/State:	Cincinnati, Ohio
Date:	May 12, 1998
Page	6 of 16

Time 14:30

- ☐ Active/Former/Closed Unit: Former Unit
- ☐ Period of Operation: Mid-50's to 1979
- ☐ Generating Process: Benzophenone
- ☐ Waste Managed/Code: Hydrochloric Acid wastewater
- ☐ Generation Rate: Unknown
- ☐ Disposition of Waste: Water Evaporate off/No Disposition
- ☐ Dimensions/Capacity: (File Material)
- ☐ Materials of Construction: Soil/Un-lined
- ☐ Secondary Containment: None
- ☐ Visual Evidences of Release: (See File)
- ☐ Structural Integrity of Unit: (Former Unit) - Currently paved/asphalt covers this area
- ☐ Documented Releases: Yes
- ☐ Corrective Action: Yes (see below)
- ☑ Location Identified on Map
- ☑ Photograph Taken

Notes: - Units reportedly closed in mid-1970's
- Currently, area is used in Tank Loading/Unloading Area

Signature: Kim Higgins

V. SOLID WASTE MANAGEMENT UNITS

(E) Former Drum Storage

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	7 of 16

Time 14:35

- ❑ Active/Former/Closed Unit: Former
- ❑ Period of Operation: 1980 - 1990
- ❑ Generating Process: Various Processes
- ❑ Waste Managed/Code: D001 Flammables / TCLP Waste
- ❑ Generation Rate: File Material
- ❑ Disposition of Waste: Shipped - Offsite
- ❑ Dimensions/Capacity: ≈ 100' x 50'
- ❑ Materials of Construction: Concrete
- ❑ Secondary Containment: None / Some Curbing
- ❑ Visual Evidences of Release: None
- ❑ Structural Integrity of Unit: O.K.
- ❑ Documented Releases: Unknown
- ❑ Corrective Action: None
- ☑ Location Identified on Map
- ☑ Photograph Taken

Notes: KRH

Signature: Kim Higgins

V. SOLID WASTE MANAGEMENT UNITS

(F) French Drain

Facility:	Morton International
City/State:	Cincinnati, Ohio
Date:	May 12, 1998
Page	8 of 16

Time 14:40

- ☐ Active/Former/Closed Unit: Active
- ☐ Period of Operation: 1995 - Present
- ☐ Generating Process: Groundwater remediation
- ☐ Waste Managed/Code: Various/GW
- ☐ Generation Rate: NA
- ☐ Disposition of Waste: Treated on-site
- ☐ Dimensions/Capacity: NA — 8 in diameter / gravel on top
- ☐ Materials of Construction: Corregated Plastic Pipe
- ☐ Secondary Containment: None
- ☐ Visual Evidences of Release: None
- ☐ Structural Integrity of Unit: Unknown
- ☐ Documented Releases: NA
- ☐ Corrective Action: No
- ☒ Location Identified on Map
- ☒ Photograph Taken

Notes: (F) Clean-Out access area identified as "F" on map; French Drain connects to slurry wall on north end of property
- Pristine site keeps "forced mains" activated on west property line; installed 1997

Signature: Kirk Higgins

V. SOLID WASTE MANAGEMENT UNITS

(6) Collection Sump

Facility:	Morton International
City/State:	Cincinnati, Ohio
Date:	May 12, 1998
Page	9 of 16

Time KDH 14:55

- ☐ Active/Former/Closed Unit: Active
- ☐ Period of Operation: 1985 - Present
- ☐ Generating Process: GW Remediation
- ☐ Waste Managed/Code: GW (Contaminated)
- ☐ Generation Rate: Unknown
- ☐ Disposition of Waste: Treated Onsite
- ☐ Dimensions/Capacity: Unknown
- ☐ Materials of Construction: Concrete / culvert pipe
- ☐ Secondary Containment: No
- ☐ Visual Evidences of Release: Unknown
- ☐ Structural Integrity of Unit: Unknown
- ☐ Documented Releases: No.
- ☐ Corrective Action: No
- ☑ Location Identified on Map
- ☑ Photograph Taken

Notes: KDH

Signature: Kim Higgins

V. SOLID WASTE MANAGEMENT UNITS

(H) Former Scale Area

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	10 of 16

Time 15:00

- ❑ Active/Former/Closed Unit: Former
- ❑ Period of Operation:
- ❑ Generating Process:
- ❑ Waste Managed/Code:
- ❑ Generation Rate:
- ❑ Disposition of Waste: Unknown
- ❑ Dimensions/Capacity:
- ❑ Materials of Construction:
- ❑ Secondary Containment:
- ❑ Visual Evidences of Release:
- ❑ Structural Integrity of Unit:
- ❑ Documented Releases: Yes.
- ❑ Corrective Action: GW Monitoring
- ☒ Location Identified on Map
- ☒ Photograph Taken

Notes: Extraction well established in Scale Area; water transferred to Collection Sump/Treatment Unit

Signature: Kim Higgins

V. SOLID WASTE MANAGEMENT UNITS

(I) Current Haz. Waste Storage

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	11 of 16

Time 15:05

- ☐ Active/Former/Closed Unit: Active
- ☐ Period of Operation: 1991 – Present
- ☐ Generating Process: Various Processes
- ☐ Waste Managed/Code: D001; Class 9 Mics. (D-Listed)
- ☐ Generation Rate: D001 (30-40 Drums/Month) D-Listed (½ Drum/Month)
- ☐ Disposition of Waste: Transported offsite
- ☐ Dimensions/Capacity: 40' * 40'
- ☐ Materials of Construction: Concrete
- ☐ Secondary Containment: Yes – Diked building
- ☐ Visual Evidences of Release: None
- ☐ Structural Integrity of Unit: O.K.
- ☐ Documented Releases: No
- ☐ Corrective Action: None
- ☒ Location Identified on Map
- ☒ Photograph Taken

Notes: D001 = Acetic Acid, By-product Methanol

Signature: Kirk Higgins

V. SOLID WASTE MANAGEMENT UNITS

(J) GW Treatment Unit
(located in Building 25)

Facility:	Morton International
City/State:	Cincinnati, Ohio
Date:	May 12, 1998
Page	12 of 16

Time 15:10

- ☐ Active/Former/Closed Unit: Active
- ☐ Period of Operation: 1985 - To Present
- ☐ Generating Process: Contaminated GW
- ☐ Waste Managed/Code: " GW
- ☐ Generation Rate: Unknown
- ☐ Disposition of Waste: Non-Contact Cooling Tower
- ☐ Dimensions/Capacity: NA
- ☐ Materials of Construction: Steel Concrete
- ☐ Secondary Containment: Yes - concrete dike
- ☐ Visual Evidences of Release: None
- ☐ Structural Integrity of Unit: O.K.
- ☐ Documented Releases: None
- ☐ Corrective Action: No
- ☒ Location Identified on Map
- ☒ Photograph Taken

Notes: KRH

Signature: Kim Haggins

V. SOLID WASTE MANAGEMENT UNITS

(M) Former Soil Piles

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	13 of 16

Time 15:40

- ❑ Active/Former/Closed Unit: Former Disposal Area
- ❑ Period of Operation: Unknown
- ❑ Generating Process: Unknown
- ❑ Waste Managed/Code: "
- ❑ Generation Rate: "
- ❑ Disposition of Waste: "
- ❑ Dimensions/Capacity: "
- ❑ Materials of Construction: "
- ❑ Secondary Containment: "
- ❑ Visual Evidences of Release: "
- ❑ Structural Integrity of Unit: "
- ❑ Documented Releases: Yes
- ❑ Corrective Action: None
- ☑ Location Identified on Map
- ☑ Photograph Taken

Notes: KRH

Signature: Kirk Higgins

VII. WRAP-UP MEETING

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	14 of 16

Time 15:20

MSDSs	☑	
Manifests	☑	
Facility Maps	☑	
Transporter (Name/City/EPA I.D.)	☑	Clean Harbor Environmental Services Hazmat
Permits: NPDES	☑	Yes
Stormwater	☑	Yes
Air	☑	Several on file
Monitoring Data	☑	None currently monitoring. Take analytical on Treatment Tank
Questions From Facility	☑	None
CBI Request	☑	Yes - will request CBI for photos -
Facility Contact	☐	Glenn Schaff
Facility's State Contact	☐	Chris Cotton (Compliance)

- Left site @ 15:30

Notes:

181'

Signature:

IX. PHOTOGRAPH LOG

Facility:	**Morton International**
City/State:	**Cincinnati, Ohio**
Date:	**May 12, 1998**
Page	15 of 16

Time	Roll	Photo	Description	Direction
2:10	1	1	satellite acc. area — fills once in 2 months - haz. due to met	east
2:15	1	2	former treatment tank - bottom containment area	south
2:15	1	3	full view of former treatment tank	"
2:20	1	4	satellite acc. area - acetic acid flammable	east
2:25	1	5	MWEPA-2	east
2:25	1	6	rail loading/unloading	S
2:27	1	7	former surface waste now fuel oil	S
2:35	1	8	slurry wall (new pavement)	W
2:35	1	9	former surf. impound. — goal way down + haz. waste storage pad	W
2:35	1	10	former haz. waste storage pad ↔ to curbing w/ blue tar	south
2:40	1	11	former surf. imp. (western section) truck unloading + loading	south
2:45	1	12	french drain clean-out	east

Notes: _____

_____

_____

_____

_____ Signature: _____

IX. PHOTOGRAPH LOG

tote tanks used to eliminate drums

Facility:	Morton International
City/State:	Cincinnati, Ohio
Date:	May 12, 1998
Page	16 of 16

Time	Roll	Photo	Description	Direction
2:45	1	13	MWEPA 1 electrical box on left	south
2:55	1	14	Pristine Water Coll. line excavated area	east
2:55	1	15	view into coll. sump	↓
3:00	1	16	collection sump area	south
3:05	1	17	purge well	east
3:10	1	18	current haz. waste area	north west
3:10	1	19	product storage w/containment	west
3:15	1	20	water processing area. big blue tanks in the carbon filter	north w
3:20	1	21	former UST area - (2) fuel oil one removed one remediated	south in place filled w/concr
3:20	1	22	boiler area - 2 large nat. gas or #2 fuel	n
3:40	1	23	former soil disposal area.	nw
	1	24		

Notes: _____

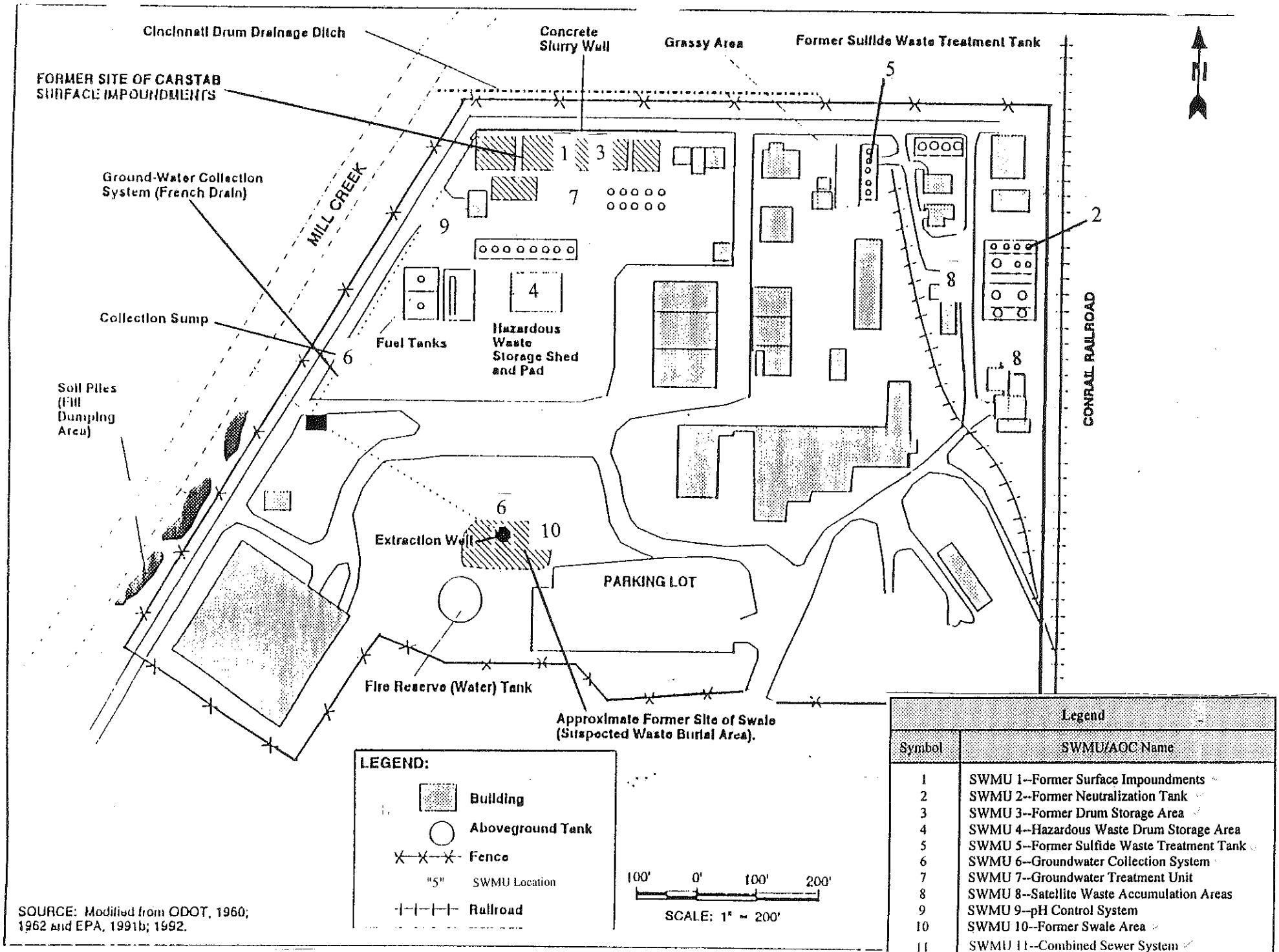
_____

_____

_____

_____ Signature: _____

APPENDIX C
Facility Layout and SWMU and AOC Locations



Legend	
Symbol	SWMU/AOC Name
1	SWMU 1--Former Surface Impoundments
2	SWMU 2--Former Neutralization Tank
3	SWMU 3--Former Drum Storage Area
4	SWMU 4--Hazardous Waste Drum Storage Area
5	SWMU 5--Former Sulfide Waste Treatment Tank
6	SWMU 6--Groundwater Collection System
7	SWMU 7--Groundwater Treatment Unit
8	SWMU 8--Satellite Waste Accumulation Areas
9	SWMU 9--pH Control System
10	SWMU 10--Former Swale Area
11	SWMU 11--Combined Sewer System (exact location unknown)

Morton International, Inc., Reading, Ohio
Facility Layout and SWMU and AOC Location Map

APPENDIX D
Historical Hazardous Waste Streams

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1981	Spent non-halogenated solvents	F005	48 T
	Recovered Methanol	U154	171 T
	Spent Solvents and Residues	D001	3 T
	Acid Solvent Residues	D002	68 T
	Recovered Acid Layers and Residues	D002	447 T
	Scrubber Solutions	D003	26 T
1982	Spent Solvents and Residues from chemical processes - Ignitable	D001	135 T
	Scrap Residue from chemical product manufacture - EP Toxic	D008 Lead	129 T
	Spent Non-halogenated Solvents from chemical processes	F005	121 T
	Recovered Acid layers from chemical processes - Corrosive	D002	62 T
	Scrubber Solution from Pollution Control - Reactive	D003	40 T
	Acid Solvents and Residues from chemical Processes Corrosive	D001	38 T
	Laboratory Wastes from Quality and Research Work	D002, D003	8 T

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
1983	Scrap Residues from chemical Plant processes - EP Toxic	D008	112 T
	Filter Press Papers and Residues from chemical plant processes - EP Toxic	D004, D008	108 T
	Spent Mixed Solvents and Residues from chemical plant processes - Ignitable	D001	60 T
	Recovered Acid Layers from chemical plant processes - Corrosive	D002	141 T
	Laboratory Wastes from Quality Control and Research Work - Corrosive	D002, D003	14 T
	Scrubber Solutions from Pollution Control Processes - Reactive	D002, D003	29 T
	Spent Non-halogenated Solvents from chemical plant processes	F005	70 T
	Spent Acidic Solvents and Residues from chemical plant processes - Ignitable	D001, D002	7 T
	Spent Solvents and Residues from chemical plant processes - Ignitable	D001	12 T
1984	Process Scrap Residue - EP Toxic	D008	89 T
	Filter Press Papers and Residues - EP Toxic	D004, D008	40 T
	Research and QC Laboratory Wastes - Corrosive	D002, D004	11 T
	Acid Press Cakes and Filter Cartridges - Corrosive	D002	10 T
	Spent Acid Solvents and Residue - Ignitable	D001, D002	19 T

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Recovered Acid Layers Corrosive	D002	65 T
	Scrubber Solution Pollution Control - Reactive	D003	46 T
	Spent Non-halogenated Solvents	D001, D002	7 T
1985	Recovered Methanol	D001, F005	47 T
	Spent Solvents and Residues	D001	6 T
	Acid Solvents and Residues	D001, D002	18 T
	Recovered Acid Layer	D002	36 T
	Press Papers and Residues	D004, D008	25 T
	Press Papers and Residues	D002	4 T
	Process Scrap Residue - EP Toxic	D008	106 T
	Research and QC Laboratory Wastes	D004, D008	9 T
1986	Press Papers and Residues	D002	25 T
	Press Papers and Residues	D004, D008	44 T
	Process Scrap Residue - EP Toxic	D004, D008	78 T
	Acid Solvents and Residues	D001, D002	22 T
	Laboratory Wastes from QC and Research	D004, D008	4 T
	Laboratory Wastes from QC and Research	D002	65 T
	Recovered Methanol	D001, F005	52 T
	Spent Solvents and Residues	D001	11 T
	Recovered Acid Layer	D002	24 T

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Sulfur Monochloride and Soda Ash	D003	0.2 T
1987	Recovered Acid Layers	D002	49 T
	Waste Recovered Methanol	D001, F003	72 T
	Waste Spent Solvents and Residues	D001	8 T
	Waste Acid Solvents and Residues	D001, D002	12 T
	Waste Scrubber Solution	D002, D003	58 T
	Waste Press Papers and Residues	D002	19 T
	Waste Press Papers and Residues	D004, D008	57 T
	Laboratory Wastes from QC and Research	D004, D008	2 T
	Laboratory Wastes from QC and Research	D002	20 T
1988	Waste Acetic Acid Layer	D002	20 T
	Waste Press Papers and Residues	D008	65 T
	Waste Scrubber Solution	D002, D003	12 T
	Waste Acid Solvents and Residues	D001, D002	29 T
	Waste Recovered Methanol	D001	47 T
	Waste Spent Solvents and Residues	D001	6 T
	Waste Press Papers and Residues	D002	7 T
	Laboratory Waste from QC and Research	D002	1,600 P
	Laboratory Waste from QC and Research	D002, D003	800 P

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Laboratory Waste From QC and Research	D002, D003, D008	8 T
	Laboratory Waste from QC and Research	D002	1 T
	Waste Spent Solvents and Residues	D001	1,600 P
	Waste Scrubber Solution	D002, D003	400 P
	Waste Acid Solvent Solid	D001, D002	2 T
1989	Ignitable and Corrosive Lab Packs Retainer Samples from Quality Assurance - Liquids and Solids	D001, D002	200 P
	Corr. and React. Sulfide Scrubber Cleanout Solid	D002, D003	23 T
	Corr. EP Toxic Methyltin Chlorides Solid/Liquid	D002, D004, D008	2 T
	Flam. Liq. Spent IPA and Phosphonium Halides	D001	2,800 P
	Flam. Liq. Isopropanol Spill Cleanup W/Clay AB	F002	800 P
	Flammable Liquid Methanol By-product Liq./Solids	D001	1,200 P
	EP Toxic Methyltin Chloride Spill Cleanup with Soda Ash	D004	400 P
	Flammable Liquid Methanol By-product	F002, F003, F005	46 T
	Flam. Liq. Spent Isopropanol and Phosphonium Salt	F002, F003, F005	7 T
	Flammable Liq. Scrap Mercapto-ethylester	D001	4 T
	Non Req. Hydrocarbon Oils Shipped W/ "F" Waste	F002, F003, F005	4 T

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Spent Lab Solvents-Titrations-Clean Lab Ware, Etc. Acetone Toluene-IPA-Meoh-Xylene-<1% HOC	D002 F002, F003, F005	4 T
	EP Toxic Methyltinoctylthio-glycolate Press Cake Solid	D008	53 T
	Flam.-Phosphonium Acetate-NH4C1 Nutsche Solid	D001, D002	5 T
	Flam. Acetic A. Phosphonium Acetate Distil. Liq.	D001	5 T
	Corrosive Sodium Hydroxide Spill Cleanup Solid	D002	5,200 P
	Flam. Liq. Spent IPA and Phosphonium Halides L and S	D001	2 T
	Flam. Phosphonium Halides Nutsche Cake, Solid	D001	1 T
	Corr. EP Toxic Methyltin Chloride Sat. Insulation	D002, D008	1,200 P
	EP Toxic Spill Cleanup Tank Truck Dock Solid	D008	800 P
	Corr. Lab Pack Chem. Group C and F Discarded L and S	D002	800 P
	Corr. EP Tox. Methyltin Chloride Filters Solid	D002, D004	5,200 P
	EP Toxic Mathultinoct-Thioglycolate Presscake Solid	D008	4,000 P
	EP Toxic Methyltinchloride Spill Cleanup Na2C03 Sol.	D004	2,000 P
	EP Toxic Stannous Chloride Cleanout Solid	D008	2,000 P

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Corr. Methyltinchloride Spill Cleanup Solid	D008 D002, D007	1,200 P
	Corr. Methyltinchloride Spill Cleanup Solid	D002	400 P
1990	EP Toxic Organotinmercaptide Press Cake Solid	D008	23 T
	Ignitable and Corrosive Lab Packs Retainer Samples from Quality Assurance. Liquids and Solids	D001, D002	200 P
	Ign. Liq. Spent Isopropanol and Phosphonium Salt	D001, D002	4 T
	Ign. Liq. Dist. Spent Propylene Glycol Solvent	D001	455 P
	Ign. Liq. Spent Lab. Solv. Acetone, Toluene, Others.	D001 F001, F005	4 T
	Ign. Liq. Spent Xylene, Equipment Cleanout	D001, F003	1 T
	Ign. Liq. Lab Pack Pyridine from R and D Routine Wk.	D001 D008, U196	1 P
	Lab Packs Corrosive, Reactive, EP Toxic from Routine Research and Development Work. Solids and Liquids	D002, D003, D005, D006, D008, D010, D011	200 P
	Ign. Phosphonium Acetate-NH4Cl Nutsche Solid	D001, D002	1,800 P
	Ign. Acetic A.-Phosphonium Ac. Dist. Res. Liquid	D001, D002	2,068 P
	Ign. Acetic A.-Phosphonium Ac. Dis. Res. Liquid	D002	2,205 P
	Corr. EP Toxic Methyltinchloride Sat. Ins. Solid	D002, D008	105 P

Year	Hazardous Waste Description	U.S. EPA Hazardous Waste Number	Amount of Waste*
	Flam. Liq. Spent Isopropanol and Phosphonium Salt	D001	16 T
	Ignitable Acetic Acid Distillates	D001	6 T
	Ign. Acetic A.-Phosphonium Ac. Dist. Res. Liquid	D001, D002	4 T
	Ignitable Liquid methanol By-product	D001	41 T
	Spent Xylene Spill Cleanup Equip. Cleanup, Solid	F003	396 P
	Corr. EP Tox. Methyltinchloride Filters, Solid	D002, D004 D007, D008	3 T
	Corr. EP Tox. Methyltincl. Sat. Insul. Solid	D002, D006	378 P
	Lab Packs Ign. Corr. EP Toxic Routine Res. and Develop. Work. Liquids and Solids	D001, D002 D003, D004	417 P
	Corrosive Methyltin Chloride Filters, Solid	D002	1,318 P

* T = tons; P = pounds.

Source: Schaaf 1991